



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/551,746 | 08/07/2006 | Zhengfeng Zhu | 09548.1007USWO | 4435 |

52835 7590 10/03/2007
HAMRE, SCHUMANN, MUELLER & LARSON, P.C.
P.O. BOX 2902
MINNEAPOLIS, MN 55402-0902

| |
|----------|
| EXAMINER |
|----------|

KIM, JOHN K

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2809

| | |
|-----------|---------------|
| MAIL DATE | DELIVERY MODE |
|-----------|---------------|

10/03/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/551,746

Applicant(s)

ZHU, ZHENGFENG

Examiner

John K. Kim

Art Unit

2809

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08/07/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-11 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/29/05, 2/1/06
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION***Drawings***

1. The drawings are objected to because in drawings 1 through 5, part numbers and characters are not recognizable.
2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Drawings are not showing four stators matching to form double face or four face air gap space to match with double face rack shaped slider or four face rack shaped slider, and no other drawing supports the claim 10. Also, the "Rotor" in claims 6, 7, 8 and 9 is one of the components of the invention motor, but the rotor is not shown in drawings. Also, the "lateral winding electromagnet" of claim 11 is not shown. These items must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining

Art Unit: 2809

figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 9 is objected to because of the following informalities:

As for claim 9, "rebalance" (line 1) is not understandable but examiner reads as "reluctance" (based on claim 6) to examine the application.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Firstly, the object that the term 'it' (line 2) is indicating is not clear.

Secondly, the transitional phrase "consisting of" (line 2) coupled with invention defined as a motor suggests a complete motor consists of only those items following the transitional phrase. A complete motor must include additional components such as a shaft. For purposes of further examination, Examiner will

Art Unit: 2809

assume the invention is directed to a motor subassembly or motor portion rather than a motor.

Thirdly, the paragraph "in the middle of magnetic path formed by the supporting housing" (line 5-6) is not clearly pointing out the location of middle of magnetic path form by the housing.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Cavusoglu (WO 9905772). Cavusoglu clearly shows (in Fig. 1) and discloses a kind of outer magnetic circuit bias magnetic type reluctance motor with permanent magnets, wherein it is consisting of supporting housing (4), stator (3), rotor (1) and permanent magnet body (2). Cavusoglu explains (abstract) "[t]he stator consists of permanent magnets (2) and an additional coil (3). Examiner considers either any two individual magnets or the permanent magnets and coil to be a pair of independent structures. Cavusoglu's figure 1 also shows the permanent magnets (2) arranged between the supporting housing (4) made of magnetic conductive material and the stator (3). Cavusoglu's figure 2-4 show magnetic field lines and the position relative to permanent magnet 2 and housing 4. The permanent magnet 2 is shown approximately in the middle of magnetic path.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cavusoglu (WO 9905772) in view of Langley (US 4286180).

As for claim 2, Cavusoglu clearly shows and discloses the claimed invention as applied to claim 1 above. Cavusoglu, however, does not specifically disclose a pair of stator.

In the same field of endeavor, Langley presents (in Fig. 3A) an invention that contains at least a pair of stators (52,53) get together in circumferential direction to form inner cylinder or outer cylinder air gap space (gap between 54 and 56) and to match with cylinder shaped inner rotor or outer rotor (51 and 61).

Art Unit: 2809

Therefore, it would have been obvious for ordinary skilled in the art at the time the invention is made to consist dual stator to effectively increase the output torque of the motor.

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cavusoglu (WO 9905772) in view of Welburn (US 4501980).

As for claim 8, Cavusoglu clearly shows and discloses the claimed invention as applied to claim 6 above. Cavusoglu, however, does not specifically disclose a cup-shaped rotor aligned with two stators.

In the same field of endeavor, Welburn presents (in Figs. 2, 3) an invention that contains a motor characterized in that the inner (10) and outer (20) stator in pair match in the radial direction to form double air gap space (two air gap space between 10 and 20 and 12) to match with cup-shaped rotor (12).

Therefore, it would have been obvious for ordinary skilled in the art at the time the invention is made to consist dual stator and cup-shaped rotor to effectively change the orientation of output torque of the motor.

10. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cavusoglu (WO 9905772) in view of Hsu et al (US 2006/0131986).

As for claim 9, Cavusoglu clearly shows and discloses the claimed invention as applied to claim 6 above. Cavusoglu, however, does not specifically disclose disk-shaped stators aligned with disk-shaped rotor.

Art Unit: 2809

In the same field of endeavor, Hsu et al presents (in Figs. 1, 3) an invention that characterized in that the paired stators (11, 12) have the disk-shaped end face (Fig. 3), the two stators match in axial direction to form double air gap space (gap between 11, 12 and 24) to match disk-shaped rotor (24).

Therefore, it would have been obvious for ordinary skilled in the art at the time the invention is made to consist dual stator to effectively use the space effective flat shape structure of the motor.

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cavusoglu (WO 9905772) in view of Tsuboi et al (US 20010048249).

As for claim 10, Cavusoglu clearly shows and discloses the claimed invention as applied to claim 6 above. Cavusoglu, however, does not specifically disclose planer-shaped stators aligned with rack-shaped slider.

In the same field of endeavor, Tsuboi et al presents (in Figs. 3, 7, 8) an invention that characterized in that the paired stators (12) have the planer shape, two or four stators of them match to form double face or four face air gap space (gap between 13 and 12) to match with double face rack shaped slider or four face rack shaped slider. (see slider component 25 is rack shaped)

Therefore, it would have been obvious for ordinary skilled in the art at the time the invention is made to consist dual stator to effectively use the planer shaped stator and rack shape slider for linear motion.

Art Unit: 2809

12. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cavusoglu (WO 9905772) in view of Li (US 5923142).

As for claim 10, Cavusoglu clearly shows and discloses the claimed invention as applied to claim 6 above. Cavusoglu, however, does not specifically disclose replacement of permanent magnet with electro magnet with lateral winding.

In the same filed of endeavor, Li shows (in Fig. 1) use of electromagnet (17a-d) for DC assisted excitation of the field in the reluctance motor. Permanent magnet has demagnetization problem naturally, and one of solutions for this problem is using lateral winding electromagnet. Thus, permanent magnet can be replaced by electromagnet constituted of most typical lateral winding to produce steady state magnetic field for stator excitation. However, in order to replace the permanent magnet with electromagnet, structure and powering method should be changed significantly. Li shows (in Fig. 12) and discloses (column 16 line 15 – column 18 line 20) powering to the excitation winding.

Therefore, it would have been obvious for ordinary skilled in the art at the time the invention is made to replace electromagnet with permanent magnet for auxiliary field excitation.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Claims 6-11 are rejected as being anticipated or obvious for those ordinary skilled in the art.

Art Unit: 2809

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John K. Kim whose telephone number is (571) 272-5072. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Garber can be reached on 703-585-9637. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



CHARLES D. GARBER
SUPERVISORY PATENT EXAMINER

JK

JK